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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,772	03/06/2002	Xin Jin	555255012315	6853

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EXAMINER

GHULAMALI, QUTBUDDIN

ART UNIT	PAPER NUMBER
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2611

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,772	JIN ET AL.	
	Examiner	Art Unit	
	Qutub Ghulamali	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 35 is/are rejected.
- 7) ☒ Claim(s) 14-34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/24/2006 has been entered.

Response to Remarks/Amendment

2. Applicant's remarks, filed 04/24/2006, see pages 10-11, with respect to the rejection(s) of claim(s) 1-13, 8, 19-20, 22, 26 and 32-35 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive. Applicant has amended claims 1, 2, 4 and 10 of which claim 1 is an independent claim, by replacing correlation with auto-correlation. The applicant's introduction of auto-correlation introduces new subject matter that is not supported by the disclosure (specification) as originally filed. The applicant is therefore, required to cancel the new matter in reply to this Office Action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 1 and dependent claims 2, 4 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The applicant's introduction of auto-correlation introduces new subject matter that is not supported by the disclosure (specification) as originally filed.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claim 14 and dependent claims 15-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitation "the **received** total sum" in line 22. There is insufficient antecedent basis for this limitation in the claim.

Claim Objections

7. Claim 14 is objected to because of the following informalities: Claim 14, line 24, recites, "receive the total sums" and "the received total sums". These recitations are

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inconsistent with the claim language used elsewhere in the claim. Shouldn't it be
"receive total sum functions" and "the received total sum functions" respectively?

Claim 14, line 24 after "receive the total sum functions" the wordings "and the conjugate of the received total sum" and after "the received total sum functions" the wordings "and the conjugate of the received total sum", needs to be inserted.

Appropriate correction is required.

Response to Remarks

8. Applicant's assertion that Dabak does not disclose the claimed limitation, "calculating a correlation function based on the total sum functions for the first and second sets". The examiner disagrees. The examiner would most respectfully like to draw applicant's attention to Dabak (6,775,260) reference col. 7, lines 45-67 and col. 8, lines 1-34) showing the features of the disclosure as claimed, wherein a cross-correlation function matrix is calculated to determine interference effects of each path between each symbol by correlation of complete sum. Based on the disclosure in Dabak, the examiner concludes the claimed limitation alleged to is properly satisfied.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-13 rejected under 35 U.S.C. 102(e) as being anticipated by Dabak et al (US Patent 6,775,260).

Regarding claim 1, Dabak discloses a method of obtaining a frequency error estimate of the difference between a reference frequency and the frequency of a space time transmit diversity signal (fig. 1, elements 102, 100, 104, 106, 108), from first and second received sequences of symbols, transmitted respectively by first and second antennae (ANT 1, ANT 2), where each sequence has two sets of first and second intervals, such that the contents of the second interval of the second received sequence are the additive inverse of the contents of the first interval of the second received sequence comprising:

receiving the first and second sequences of symbols (figs. 1, 5A) (col. 3, lines 52-67; col. 4, lines 5-10);

calculating two sets of first and second partial sums as the sum of the contents of the first and second intervals, respectively, for each set (col. 5, lines 15-20);

calculating total sum functions for the first and second sets by summing the first and second partial sums for each set (col. 5, lines 20-40);

calculating a correlation function based on the total sum functions for the first and second sets (col. 5, lines 62-67; col. 6, lines 1-9, 46-54); and

extracting the frequency error estimate from the correlation function (col. 7, lines 45-56; col. 8, lines 16-22).

Regarding claim 2, Dabak discloses the correlation function is calculated as a time average of the product of the first total sum function and the conjugate of the second total sum function (col. 6, lines 10-19, 41-67).

Regarding claim 3, Dabak discloses the received symbols are represented by complex numbers (col. 6, lines 41-46).

Regarding claim 4, Dabak discloses extracting includes isolating the imaginary part of the correlation function as the frequency error estimate (col. 7, lines 45-56).

Regarding claim 5, Dabak (602) discloses the first and second interval in each set is adjacent (fig. 1, elements T, 2T).

Regarding claim 6, Dabak discloses the first and second sets of intervals are interleaved (rearranged) with each other (col. 5, lines 16-26).

Regarding claims 7-9, Dabak discloses contents of the first and second intervals in each set form a complete symbol (col. 5, lines 17-32).

Regarding claim 10, Dabak discloses adding the correlation to a correlation of a second set of total sum functions calculated by summing the first partial sum with the additive inverse of the second partial sum (col. 7, lines 45-67).

Regarding claim 11, Dabak discloses multiplying the frequency error estimate by the average of a signal-to-noise-ratio of the received sequences (fig. 2; col. 4, lines 23-52).

Regarding claim 12, Dabak discloses altering the reference frequency based on the frequency error estimate to minimize the difference between the reference

frequency and the frequency of the space time transmit diversity signal (col. 8, lines 15-25).

Regarding claim 13, Dabak discloses carrying out all of the steps parallel to provide a multitude of diverse correlation functions (see claim 1 above); and combining the multitude of diverse correlation functions to provide the correlation function before extracting the frequency error from the correlation function (see claim 1 above).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak et al (US Patent 6,775,260) in view of Hadad (USP. 6,985,432).

Regarding claim 35, Dabak discloses all limitations of the claim, except does not explicitly disclose frequency error is a carrier frequency error and the reference frequency is a receiver reference frequency. Hadad in a similar field of endeavor discloses frequency error is a carrier frequency error and the reference frequency is a receiver reference frequency (col. 1, lines 51-55; col. 14, lines 37-44). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use frequency error as taught by Hadad in the circuit of Dabak because it can

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mitigate the error between the received signal and the reference signal to provide a correction signal to compensate for error in transmission (shift in frequency) at the receiver.

Allowable Subject Matter

13. Claim 14 and dependent claims 15-34 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, and overcome claim objections, set forth in this Office action.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents.

US Patent (6,754,253) to Guey.

US Patent (6,754,286) to Hottinen et al.


15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.
June 25, 2006.


JEAN B. CORRIELUS
PRIMARY EXAMINER
6.26.06